-----Original Message-----
From: Ben Sleeter [mailto:bsleeter@gmail.com]
Sent: Sunday, March 27, 2005 11:48 PM
To: MLPAComments@resources.ca.gov; Melissa Miller-Henson; John Kirlin
Subject: Revised Draft comments.

MLPA staff,

Attached you will find comments from the Coastside Fishing Club on the 'Revised Draft Master Plan Framework'. In addition to our edited Word document you will find a summary letter with a general discussion.

Coastside thanks you for the opportunity to prvide comments on this process.
--
Ben Sleeter
Coastside Fishing Club

Coastside Fishing Club
666 Brighton Road, Pacifica, CA 94044

To MLPA Staff, DFG, Blue Ribbon Task Force, Science Advisory Team,
Re: Public comments on Revised Draft Master Plan Framework
Date: March 25, 2005

The Coastside Fishing Club extends our thanks for the opportunity to provide comments on the revised Draft Master Plan Framework. Attached you will find an edited Microsoft Word document with specific notes and comments.

Generally speaking we find this edition of the DMPF to be a substantial improvement over the previous version. The addition of flowcharts and diagrams to outline the inter-relationships between various groups and processes is good. Perhaps the biggest improvement is found in Chapter 2, "Design of MPAs and the MPA network" where the reader can begin to understand the method and process used to accomplish the goals of the MLPA. The revised structuring of the document is also a major improvement.

We do have a few areas of concern and they are outlined here:

1. There seems to be a contradiction between the idea of "permanent MPAs" and adaptive management. It should be made clear that should information become available that has an impact on the design or function of a specific MPA that the MPA be modifiable. Permanent MPAs, when combined with an absence of any monitoring and evaluation, appear to be nothing more than an attempt to remove all fishing activity forever.
2. Monitoring and evaluation techniques should be outlined in the initial design phase rather than at the end of the process. By addressing monitoring and evaluation early-on in the process unique opportunities may become available.
3. The study area selection is an important component of this process. If the intent of the Draft Master Plan Framework is to serve as a guide for future implementation the methods and conclusions regarding the initial study area should be presented in detail in this document.
4. Size and spacing of MPAs. We feel that no hard rules regarding MPA size and spacing be put in place until more knowledge can be gleaned from examples in California. The elements in the DMPF should serve as reference points only.
5. We would like the BRTF to consider extending the date for the document adoption until after the Central Coast study area has been determined (from the April meeting to the May meeting). We also would like to see the comments from the Science Advisory Team incorporated into a revised draft for final public review and comment. Because the study area decision was pushed back over a month and the awkward timing of the comment period and recent Science Advisory Team meeting we feel that granting an extension would be a prudent decision and would allow for a more comprehensive review of the document that will be guiding this process for years to come.

Coastside Fishing Club
666 Brighton Road, Pacifica, CA 94044

The Coastisde Fishing Club thanks you for this opportunity to comment on the Revised Draft Master Plan Framework document.

Sincerely,

Ben Sleeter
MLPA Representative, Coastside Fishing Club

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE

REVISED DRAFT MASTER PLAN FRAMEWORK

"Clean" version for editing purposes
Edits submitted by Coastside Fishing Club

March 27, 2005

Deleted: 15

CONTENTS

Executive Summary

[To be prepared upon the completion of a draft master plan framework.]

Section 1. Introduction

The rich natural heritage of California has supported commercial and recreational fisheries, which have provided consumers with a healthy source of high-quality protein, recreational anglers with a unique experience, and many coastal communities with sources of employment and revenues. California's nearshore waters have become among the top destinations for sport divers from around the world. Whether watching the flight of birds or the graceful forms of dolphins and whales, Californians also have increasingly sought enjoyment from observing marine wildlife. The dramatic growth of marine aquaria along the coast also serves as evidence of growing public interest in ocean wildlife, while California's century-long renown as a leader in marine science has only grown. California enjoys beautiful and productive marine resources.

In 1999, the State of California adopted the Marine Life Protection Act (MLPA), one in a long history of statutes and regulations designed to protect California's ocean and estuarine waters and the species and habitats found within them (FGC Section 2851-2863). The Department of Fish and Game is required to prepare and present to the Fish & Game Commission a Master Plan that will guide the adoption and implementation of the Marine Life Protection Program (FGC Section 2855[b]1). The Commission is required to adopt a master plan, based on the best readily available science, which includes recommendations for a statewide network of marine protected areas (FGC Section 2855[a]).

Another relevant law, the Marine Managed Areas Improvement Act (Public Resources Code, Sections 36600 et seq.), was adopted in 1998. The two measures, taken together, represent a very strong state policy declaration that California intends to protect its oceans and the marine species that live there and provide direction on how to proceed.

The California Ocean Protection Act, (Public Resources Code, Sections 35500 et seq.) was adopted in 2004. One purpose of this law was to coordinate activities of state agencies that are related to the protection and conservation of coastal waters and ocean ecosystems, in order to improve the effectiveness of state efforts to protect ocean resources within existing fiscal limitations. Related to this legislation, on October 18, 2004, Governor Arnold Schwarzenegger announced an Ocean Action Plan, with four primary goals:

- Increase the abundance and diversity of California's oceans, bays, estuaries and coastal wetlands.
- Make water in these bodies cleaner.
- Provide a marine and estuarine environment that Californians can productively and safely enjoy.
- Support ocean dependent economic activities.

A major part of this Ocean Action Plan is the work of the MLPA Blue Ribbon Task Force and full implementation of the MLPA. These plans and laws are but the latest in California's growing efforts to ensure protection and long-term conservation, use, and enjoyment of its living marine resources.

Among other policies, the Ocean Action Plan also addresses the relationship between California's management activities and the Department of Defense as follows:

- Coordinate California ocean and coastal management activities that impact military facilities/operations with the Department of Defense, as well as requesting the Department of Defense to coordinate their activities and operational needs with the State of California to the extent possible without compromising national security objectives.

Early Years

From its very first days as a state in 1850, California has adopted statutes and regulations dealing with the ocean, fisheries, and protection of resources, commerce and industry. In an historic sense, California's history of involvement (as with most other states) has been through early steps to regulate fishing and define health and safety requirements for those who earn a living on the waters, to protection and preservation of unique areas and features along the California coastline and in state waters. The third bill adopted in the First Session of the California Legislature recognized and regulated the Bay Pilots, the professionals who to this day, guide commercial ships into San Francisco Bay.

In the early decades of statehood, California's policy toward natural resources reflected the desire of government at all levels to promote economic expansion by bringing natural resources into production (McEvoy 1986). Even so, lawmakers in California, as elsewhere, began becoming concerned that the expansion of fishing might well threaten the long-term economic health of the fishing industry. In 1852, the Legislature passed its first fishing statute to regulate the Sacramento River salmon fishery, and continued to do so over the next several decades. In 1870, the Legislature responded to the concerns of sport fishermen by establishing a State Board of Fish Commissioners, which later became today's Fish and Game Commission. In this and other ways, California led the nation. By the end of the 19th century, the California Legislature had adopted a body of fisheries management law that was a model for its time.

At the same time, the courts repeatedly upheld the importance of the state's role in protecting its resources. In 1894, for instance, the California State Supreme Court found that: "The wild game within a state belongs to the people in their collective, sovereign capacity; it is not the subject of private ownership, except in so far as the people may elect to make it so; and they may, if they see fit, absolutely prohibit the taking of it, or any traffic or commerce in it, if deemed necessary for its protection or preservation, or the public good."

Californians often feel strongly about both available fisheries and regulations on access. Some assert that Article 1, Section 25, of the California Constitution seems to give the public a "right to fish." It states "The people shall have the right to fish upon and from the public lands of the State and in the waters thereof…provided, that the legislature may by statute, provide for the season when and the conditions under which the different species of fish may be taken." However, this "right to fish" is not absolute. In 1918, the California Supreme Court considered whether a law providing for the licensing of fishermen was unconstitutional because it violated Article 1, Section 25. The court rejected the argument, finding that the provision authorizing the

Legislature to fix the seasons and conditions under which fish are taken was intended to leave the matter in the Legislature's discretion. As recently as 1995, a court reaffirmed the qualified, not fundamental, right to fish and that the language of the State Constitution was not intended to curtail the ability of the Legislature (or the Fish and Game Commission through legislated authority) to regulate fishing.

Like other economic activities, from agriculture to manufacturing, fishing began expanding rapidly in the first few decades of the 1900s. In 1912, the Legislature respond by authorizing staff for the California Fish and Game Commission, which found itself with greater and greater responsibilities for managing industrial fisheries, in particular. In 1927, the Legislature responded to growing fishing pressures by creating a Department of Natural Resources, within which it housed a Division of Fish and Game. Over the coming decades, California state agencies and universities became leaders in the relatively new field of marine fisheries research and management. In 1945, the Legislature granted the Fish and Game Commission discretionary authority over recreational fisheries. In 1947, the Legislature instituted a tax on sardine landings that was used to fund research into causes for the decline. These activities led to the inauguration of one of the world's longest series of fisheries research cruises: the California Cooperative Oceanic Fisheries Investigations, CalCOFI, a cooperative venture of the California Department of Fish and Game, Scripps Institution of Oceanography, and the National Marine Fisheries Service.

Post World War II

After World War II, the marine policies of California and other state and federal governments were based largely on several assumptions that reflected the progressive thinking of the time. First, the abundance of marine wildlife was thought to be nearly without practical limits. Second, scientists and fishery managers believed that we possessed enough knowledge to exploit marine populations at very high levels over long periods of time without jeopardizing them. Third, the value of marine wildlife was principally as a commodity to be processed and traded. Finally, the chief challenge in commercial fisheries management was to expand domestic fishing fleets in order to exploit the assumed riches of the sea.

In the face of disturbing declines in a number of fisheries, state and federal fisheries agencies around the country began an intensive review of prevailing policies in the mid-1960s. In 1967, the California Legislature passed the California Marine Resources Conservation and Development Act to develop a long-range plan for conservation and development of marine and coastal resources (1967 California Statutes Ch. 1,642). In the same year, Governor Ronald Reagan imposed an emergency two-year moratorium on commercial sardine fishing (1967 California Statues Ch. 278).

Beginning in the 1970s, views slowly shifted. Marine wildlife and ecosystems were increasingly valued for themselves and for uses such as tourism, education, and scientific research. Recognition has been growing of the need to balance the fishing capacity of fleets with the often limited and uncertain productive capacity of marine wildlife populations. Rather than seeking to extract only the maximum yield from marine wildlife populations, fisheries managers began seeking levels that are likely to be ecologically and economically sustainable into the distant future.

California's Marine Heritage

For 1,100 miles, the spectacular mass of California's lands meets the Pacific Ocean. In many areas, mountains plunge into the oceans. Elsewhere, ancient shorelines stand as terraces above the surf. Streams and rivers break through the coastal mountains and, in some places, flow into bays and lagoons rimmed with wetlands. Offshore, islands and rocks break the surface.

This is what we can easily see. But beneath the surface of the water offshore, California's dramatic geological formations continue. Unlike the Atlantic or Gulf coasts, California's shallow continental shelf is quite narrow, generally no wider than five miles. At its broadest point off San Francisco, the shelf extends 30 miles offshore before plunging from 600 feet to the abyssal region at 6,000 feet. Beyond state waters, peaks called seamounts rise from the depths to the photic zone where sunlight spurs plant growth and attracts life.

Whether near or far from shore, the ocean bottom may be rocky, sandy, or silty. It may be flat or formed of rocky reefs. In many areas along the coast, great canyons cut into the continental shelf quite close to shore. For example, the Monterey submarine canyon, which is larger than the Grand Canyon of the Colorado, begins within miles of the shoreline. There, as in other submarine canyons, marine life normally found far offshore is drawn close to land by the deep waters. Off southern California, the ocean bottom appears like a piece of crumpled paper, with basins, troughs, canyons, peaks, and cliffs alternating in a checkerboard pattern.

Ocean currents introduce other dimensions to California's coastal waters. For much of the year, the California Current brings colder northern waters southward along the shore as far as southern California. There, where the coastline juts eastward, the California Current moves offshore. In the gap between the California Current and the mainland, the Southern California Countercurrent flows into the Santa Barbara Channel. Around Point Conception, these two currents meet, creating a rich transition zone. Closer to shore and deeper, the California Undercurrent also carries warmer water northward.

Seasonal changes in wind direction commonly create seasonal patterns for these currents. In March, for instance, northwesterly winds combine with the rotation of the Earth to drive surface waters offshore, triggering the upwelling of cold, nutrient-rich water from the depths. Fueled by sunlight and the nutrients, single-celled algae bloom and create a rich soup that fuels a blossoming of marine life, attracting larger animals from seabirds and swordfish to humpback and blue whales.

By September, as the northwesterly winds die down, the cold water sinks again and warmer waters return to the coast. This oceanic period lasts into October, when the predominant winds move to the southwesterly direction. These winds drive a surface current, called the Davidson Current, which flows north of Point Conception and inside the California Current, generally lasting through February.

Laid over this general pattern are both short-term and long-term changes. Local winds, topography, tidal motions, and discharge from rivers create their own currents in nearshore waters. Less frequently, a massive change in atmospheric pressure off Australia floods the

eastern Pacific with warm water, which suppresses the normal pattern of upwelling. These short-term climatic changes, called El Niño, reduce the productivity of coastal waters, causing some fisheries and seabird and marine mammal populations to decline and others to increase. For instance, warm waters that flow north in an El Niño carry the larva of sheephead and lobster from the heart of their geographical range in Mexico into the waters off California.

Other oceanographic changes last for a decade or more and these natural fluctuations can have significant impacts on the health and composition of marine life. In these regime shifts, water temperatures rise or fall significantly, causing dramatic changes in the distribution and abundance of marine life. The collapse of the California sardine fishery occurred when heavy commercial fishing continued on sardine populations that were greatly reduced by a cooling of offshore waters in the late 1940s and early 1950s. In response to the decline in sardines, California law severely curtailed the catch. In 1977, waters off California began warming and remained relatively warm. The warmer water temperatures were favorable for sardines, whose abundance greatly increased. But the warmer waters also reduced the productivity of other fish, including many rockfishes, lingcod, sablefish, and those flatfishes that favor cold water for successful reproduction.

Currents and other bodies of water may differ dramatically in temperature and chemistry, as well as speed and direction. These factors all influence the kinds of marine life found in different bodies of water. In general terms, geography, oceanography, and biology combine to divide California marine fisheries and other marine life into two major regions north and south of Point Conception. Within each region, other differences emerge. Conservation and use of California's marine life depends partly upon recognizing these differences.

Marine Life of California

The waters off California are host to hundreds of species of fish. Thousands of species of marine invertebrates inhabit the sea floor from tidepools along the shoreline to muddy plains 8,000 feet deep. Dozens of species of coastal and offshore birds spend some part of the year in California's waters, as do 35 species of marine mammals.

This great variety of marine life reflects the different responses of groups of animals and plants to changing environmental conditions over long periods of time. In successfully meeting their needs for growth, survival, and reproduction, individual species have developed a set of characteristics that biologists call life history traits. These traits include age at maturity, maximum age, maximum size, growth rate, natural mortality, and feeding and reproductive strategies.

Differences among species can be dramatic. For instance, California market squid mature within 12 months and die soon after spawning, whereas widow rockfish do not mature until age five at the earliest and may live as long as 59 years. This has profound consequences for managing fisheries so that they are sustainable.

Reproductive strategies also vary. Queenfish, for instance, may spawn 24 times in a season, releasing their body weight in eggs into the open water, where most will be eaten whether or not they are fertilized. In contrast, species such as olive rockfish spawn just once a year,

releasing up to 500,000 larvae, which have been fertilized and developed internally. Other species, including sharks and surfperches, bear a small number of fully functional and live young each year.

Amid the variety, the life histories of fish tend to fall into several larger categories. For instance, fish species that have low rates of mortality as adults, such as many species of sharks, bluefin tuna, and billfish, also mature late and reproduce in smaller numbers. Organisms that have high rates of mortality as adults, such as anchovies and squid, grow quickly, mature early, and reproduce in large numbers. Some species spend the first several months of their lives floating as planktonic larvae in ocean currents. Climate and oceanographic changes influence the abundance of these species more than does the number of spawning adults.

Species differ also in their movements. For instance, during winter Dover sole move into deep water where they reproduce, then move into shallow water in the summer to feed. Pacific whiting migrate from their summer feeding grounds off Oregon and Washington to their winter spawning grounds off southern California and Baja California. By contrast, kelp bass, which can live to 30 years, venture less than a mile from their home range.

Individual plants and animals are part of larger communities that are linked in many ways. One of the clearest of relationships concerns who eats whom, also known as the food web. Generally, the eating begins with herbivores, who consume plants that have manufactured food through photosynthesis. These herbivores may be as small as the larva of an anchovy or as large as a basking shark. The smaller herbivores pass along much of the food value of the plants when they are eaten by primary carnivores, which in turn may be consumed by higher level carnivores. Humans enter the food web at a variety of levels, removing not only higher level carnivores, but herbivores, and even the lowest level algae.

These relationships among wildlife populations differ considerably among different habitats and communities. A decrease in the abundance of some species, due to fishing, habitat alteration, or climate changes, for instance, can affect species that feed upon them. Considering these interrelationships when managing fisheries requires an ecosystem perspective.

Healthy habitat can also play an important role in the abundance of marine wildlife. Some species of fish and shellfish are so dependent upon particular types of habitat, such as kelp forests or coastal wetlands, that the destruction or natural alteration of these habitats can devastate wild populations. Damming many major coastal rivers in California has driven most runs of Pacific salmon to dangerously low levels. Since the 1850s, 90 percent of the state's coastal wetlands have been destroyed, causing incalculable losses in coastal wildlife. Finally, pollution of coastal waters can expose marine animals to toxic chemicals and can foster changes in plant communities that wildlife depends upon.

Environmental Factors Affecting Marine Wildlife Populations

The abundance and diversity of populations of marine wildlife are influenced by a wide range of natural and human-caused factors, including short-term and long-term shifts in oceanographic conditions and numerous human activities, which may have direct or indirect

effects (Parrish and Tegner 2001; Sheehan and Tasto 2001; NRC 1995). The impact of each factor varies with distance from shore and with individual species.

Some types of natural phenomena, such as El Niño and La Niña fluctuations, may have transitory impacts on marine wildlife and their habitats, while other natural phenomena, such as longer-term shifts in oceanographic conditions, may affect the abundance of some types of marine wildlife over much longer periods (Parrish and Tegner 2001). Increasingly, fisheries managers are attempting to adjust to these natural phenomena.

As in other coastal states, the development and growth of California's population and economy, especially since World War II, has introduced additional stresses to coastal ecosystems, as development has transformed coastal watersheds, wetlands, and estuaries, and greater demands have been made on coastal ecosystems. These stresses include chemical pollution and eutrophication, alteration of physical habitat, and the invasion of exotic species (NRC 1995). Chemical pollution and eutrophication can alter the abundance and biodiversity of wildlife in estuaries and coastal environments, especially bays and estuaries (NRC 1995). The types of pollution range from toxic chemicals to partially treated sewage, and the sources of potential pollution range from point sources, such as sewage treatment plants, to non-point sources, such as runoff from agricultural and urban lands (Sheehan and Tasto 2001). Similarly, estuarine and shoreline habitats have been especially affected by residential, commercial, and industrial development (Sheehan and Tasto 2001).

The degree of impact from these stresses on water quality and habitats varies markedly along the state's coastline. Along the southern coast, storm-water runoff is a particular problem, while some waters of the central coast are most affected by agricultural runoff (Sheehan and Tasto 2001). San Francisco Bay's waters are affected both by industrial discharges and by dairy farm runoff. In some areas, particularly bays and estuaries, waters are so impaired that certain uses are prohibited or restricted.

In the last 35 years, both federal and state governments have carried out regulatory and other programs to reduce these threats to coastal ecosystems. At the federal level, the Clean Water Act launched an enormous effort to reduce the flow of sewage and industrial pollutants into coastal waters (Sheehan and Tasto 2001). Since 1990, the federal government, in cooperation with state governments, has encouraged efforts to reduce the flow of non-point source pollution. The rate of loss of sensitive coastal habitats has slowed, and in some areas, efforts are underway to restore converted wetlands. In the last several years, the state has devoted more resources to addressing coastal water quality and habitat, including major state bonds. Nonetheless, future population and economic growth will continue to place stress on coastal ecosystems.

The Marine Life Management Act

Like these other factors, fishing can have impacts on marine fish populations and other wildlife (Agardy pers comm.). As described above, California has long sought to manage fisheries in its waters for long-term sustainability. In 1998 the Legislature responded to the shifts in understanding and public values as well as declines in some fisheries and nearshore ecosystems by adopting the Marine Life Management Act (MLMA).

Before the MLMA, the responsibility for managing most of California's marine resources harvested by commercial fisheries lay with the State Legislature, while the Department of Fish and Game and the Fish and Game Commission managed the recreational fisheries and those commercial fisheries with catch quotas that changed periodically. Management of commercial fisheries under this division of responsibility was complicated, piecemeal, and oftentimes untimely, with necessary regulatory changes only occurring after much political deliberation and approval by both the California State Assembly and California State Senate.

The MLMA transferred permanent management authority to the Fish and Game Commission for the nearshore finfish fishery, the white seabass fishery, emerging fisheries, and other fisheries for which the commission had some management authority prior to January 1, 1999. As importantly, the MLMA broadened the focus of fisheries management to include consideration of the ecosystem—that is, the species that interact with a fishery.

Recent Developments

The Marine Life Protection Act (MLPA) was enacted in 1999. In doing so, the State Legislature recognized the benefits of setting aside some areas under special protection and of ensuring that these marine protected areas (MPAs) were developed in a systematic manner, with clear goals and objectives, and effective management plans and programs for monitoring and evaluating their effectiveness. Rather than focusing on one use or value for marine areas, the MLPA recognized a wide range of values, including the conservation of biological diversity[1]. Although it may appear that the MLPA was contrary to the spirit of the MLMA in that the Legislature once again became more involved in fishery management, two points are worth noting: 1) the goals of the MLPA do not relate primarily to fishery management; 2) the ultimate decision of how to improve the existing array of MPAs resides with the Fish and Game Commission rather than the State Legislature.

The MLPA had two unsuccessful attempts at implementation between its passage in 1999 and the creation of the MLPA Initiative in 2004. Each attempt suffered from a lack of adequate resources to ensure a robust multi-stakeholder involvement and to provide needed information, particularly as related to the potential socioeconomic impacts of new MPAs. The first attempt was particularly problematic when DFG and the MLPA Master Plan Team developed a set of initial proposals for a statewide network of MPAs without stakeholder input, even though the intent was to revise these initial proposals based on public comment. The second attempt was much more inclusive of stakeholder input, but suffered from a lack of staff availability and funding for the large public involvement process. After these unsuccessful attempts, state legislators and agencies realized that this is a much more complex and controversial process, requiring significant resources and time to implement successfully and evaluate subsequently.

[1] Biological diversity or "biodiversity" is defined by Public Resources Code Section 12220(b) as: a component and measure of ecosystem health and function. It is the number and genetic richness of different individuals found within the population of a species, of populations found within a species range, of different species found within a natural community or ecosystem, and of different communities and ecosystems found within a region.

Shortly after, but unrelated to, passage of the MLPA, several major recreational and commercial fishery closures were enacted to protect populations of certain rockfish species and lingcod that were declared overfished by the National Marine Fisheries Service. The closures, which remain in effect today, are generally depth-based and specific to certain types of bottom-fishing gear. The primary closures are the Cowcod Conservation Area (CCA) in southern California, which is almost entirely in federal waters, and the Rockfish Conservation Area (RCA), which is statewide and encompasses portions of state and federal waters. Additional depth-based seasonal fishing restrictions for certain recreational fisheries were also established during 2000 and 2001 outside of the CCA and RCA and remain in effect today. While portions of the RCA are open seasonally to bottom fishing, certain depth zones in certain parts of the state are closed year-round and thus function as de facto MPAs. ~~One important distinction between these closures and MPAs is that the former, while potentially of long-term duration, are not intended as permanent closures.~~ (The idea of adaptive management should include the abolishment of MPAs if there goals and objectives are not being met. This would be contrary to idea of 'permanent closures'.

A significant increase in the total amount of state waters included in MPAs occurred in 2003 when the Fish and Game Commission adopted a system of 12 new MPAs (10 state marine reserves and 2 state marine conservation areas) around the Santa Barbara Channel Islands. This occurred following a stakeholder-based process which lasted approximately 5 years. Monitoring of the new MPAs, and of the effect they are having on local fishing patterns, is now occurring. (Monitoring efforts should be expanded upon here. What type of monitoring, initial results?)

California is able to take advantage of several decades of experience and study regarding MPAs elsewhere in the United States and abroad, as well as within its own waters. As is the case in other areas of natural resource management and conservation, including fisheries management, there is much to learn about the effective design of MPAs and their benefits. While there is substantial literature regarding some elements of MPAs it is important to note that techniques and management strategies used in other climates and environments may or may not directly transfer to California waters..It may be necessary to mix and match various methods to achieve the optimal result.

Recent work supports the legislative findings of the MLPA. In 2001, for instance, a committee of the National Academy of Sciences released its report *Marine Protected Areas: Tools for Sustaining Ocean Ecosystems*. Like other reports of the National Academy of Sciences, this report can be considered an authoritative general review of the science of marine protected areas. Among other things, this expert panel concluded:

- A growing body of literature documents the effectiveness of marine reserves for conserving habitats, fostering the recovery of overexploited species, and maintaining marine communities.

- Networks of marine reserves, where the goal is to protect all components of the ecosystem through spatially defined closures, should be included as an essential element of ecosystem-based management.

Formatted: Font color: Red, Strikethrough

Formatted: Not Strikethrough

Formatted: Not Strikethrough

Formatted: Not Strikethrough

Formatted: Font color: Red, Strikethrough

Deleted:

- Choosing a location for a marine reserve or protected area requires an understanding of probable socioeconomic impacts as well as the environmental criteria for siting.

- It is essential to involve all potential stakeholders at the outset to develop plans for MPAs that enlist the support of the community and serve local conservation needs.

- Marine reserves and protected areas must be monitored and evaluated to determine if goals are being met and to provide information for refining the design of current and future MPAs and reserves.

- Sufficient scientific information exists on the habitat requirements and life-history traits of many species to support implementation of marine reserves and protected areas to improve management.

Since the National Academy of Sciences report, a vigorous discussion among scientists and decision makers has explored the benefits and costs of MPAs, particularly marine reserves (Nowlis and Friedlander 2004; Hilborn et al. 2004; SSC 2004; NFCC 2004; FAO 2004). Many of these discussions have focused upon the use of marine reserves as a fisheries management tool, and the effect of marine reserve designation on fishing operations, fisheries management, and fish populations outside reserves. Scientists agree that empirical evidence for increased fish catches outside marine reserves is sparse. Without additional experience, assessing the appropriateness of marine reserves for fisheries enhancement purposes will remain difficult.

Recent literature acknowledges potential value of marine reserves for protection of habitat and biodiversity within reserve boundaries (Hilborn et al. 2004; FAO 2004). For the purposes of fisheries management, this same literature cites benefits of marine reserves, including buffering against uncertainty, reducing collateral ecological impacts, managing multispecies fisheries, and improving knowledge. At the same time, potential problems with marine reserves have been cited, including possible shifts in fishing effort, disruption of stock assessment research, and socioeconomic impacts (Hilborn et al.2004; FAO 2004; SSC 2004). These authors urge care in the design of marine reserves so as to minimize losses to fisheries and to increase the opportunity to obtain empirical information on marine reserves by careful experimental design (Hilborn et al. 2004; SSC 2004). These studies also note that for certain species, especially species with highly mobile adults, marine reserves are unlikely to benefit fisheries (Nowlis and Friedlander 2004; Hilborn et al.; SSC 2004; NFCC 2004). When designing marine reserves or other MPAs with a goal of enhancing fisheries, the target species and potential impacts must be considered.

MLPA Initiative Process

A more inclusive, robust process for the MLPA Initiative has been developed, with the inclusion of the following groups:

1. Blue Ribbon Task Force (an oversight body)
2. MLPA Initiative staff

Deleted: an MLPA
Formatted: Indent: First line: 0.5"
Deleted: ,
Formatted: Indent: Left: 0.5"

3. Master Plan Science Advisory Team (an expansion of the former Master Plan Team with additional expertise)
4. Statewide Interests Group for providing advice on the process, a regional stakeholder group for each region of the phased process of developing alternative proposals for proposed MPAs,
5. Peer review group
6. DFG staff
7. Fish and Game Commission.

A flow chart is provided to explain the links within the process (see Figure 1).

Blue Ribbon Task Force

Description of roles and responsibilities

MLPA Initiative Staff

Description of roles and responsibilities

Science Advisory Science Team

The Master Plan Science Advisory Team (SAT) is charged with assisting the task force in developing a draft Maser Plan Framework by reviewing and commenting on scientific papers, reviewing draft Master Plan documents, and addressing scientific issues presented by those documents. The SAT may provide information concerning habitat mapping, which habitats to include in an MPA network, habitat requirements of species, regional species lists, and potential socioeconomic impacts of proposed MPAs, and may assist in the evaluation of the effectiveness of existing MPAs. The SAT will review alternative MPA proposals developed by the Regional stakeholder groups and provide comment relative to the science-based requirements of the MLPA.

Statewide Interest Group

Description of roles and responsibilities

Regional Stakeholder Groups

Each regional stakeholder group (RSG) will be responsible for initially evaluating the existing MPAs within its region. This group will serve as a focus for regional discussions regarding the major aspects of designing MPA alternatives, including: 1) setting goals and objectives; 2) discussing the needs for additional MPAs within the region in order to meet the requirements of the MLPA; 3) evaluating existing relevant biological and socioeconomic information; 4) determining needs for additional information; and 5) developing options on the type, location, size, and boundaries for individual components of the network. The RSG should have the best available scientific information and mapping data for the region, and this information should be available to the public. A member of the SAT subteam will attend each RSG meeting to

Deleted: , a
Deleted: , a
Deleted: a p
Formatted: Indent: First line: 0.5"
Deleted: ,
Deleted: , and the
Formatted: Font: Bold, Italic
Formatted: Font: Bold, Italic
Formatted: Font: Not Bold
Formatted: Font: Bold, Italic
Formatted: Font: Bold
Formatted: Font: Bold, Italic
Formatted: Font: Italic

provide assistance. The RSG will work closely with a sub-team, and both of these groups will be provided organizational, process, and scientific support by DFG and MLPA Initiative staff.

Peer Review Group

Description of roles and responsibilities

DFG Staff

Description of roles and responsibilities

Fish and Game Commission

Description of roles and responsibilities

The director of the Department of Fish and Game and the central coast project manager for the MLPA Initiative will solicit nominations, and select from the nominees a group representing the range of stakeholder interests in the study region.

[FIGURE DELETED]

Note: input is solicited from the interested public and stakeholders at each step, until adoption of regulations by the Fish and Game Commission.

Master Plan Framework

What is the difference between the "Draft Master Plan Framework and the Master Plan identified below? Will this document (eventually) include the second principal part (description of preferred alternatives – as they become available)?

The MLPA calls for the development of a master plan by the Department of Fish and Game, and its adoption by the Fish and Game Commission. The MLPA Initiative has divided the **master plan** into two principal parts: a section providing guidance in the application of the MLPA to the development of a statewide MPA network, and a section describing the preferred alternatives for MPA proposals. One of the objectives of the MLPA Initiative is to develop a master plan framework that can guide the design of MPA proposals in the central coast study

Formatted: Font: Bold, Italic

Formatted: Font: Bold, Italic

Formatted: Font: Bold, Italic

Deleted: ¶
¶
Role of the Master Plan Science Advisory Team¶

Formatted: Font: Bold

Deleted: The Master Plan Science Advisory Team (SAT) is charged with assisting the task force in developing a draft Maser Plan Framework by reviewing and commenting on scientific papers, reviewing draft Master Plan documents, and addressing scientific issues presented by those documents. The SAT may provide information concerning habitat mapping, which habitats to include in an MPA network, habitat requirements of species, regional species lists, and potential socioeconomic impacts of proposed MPAs, and may assist in the evaluation of the effectiveness of existing MPAs. The SAT will review alternative MPA proposals developed by the Regional stakeholder groups and provide comment relative to the science-based requirements of the MLPA.¶

Deleted: *Role of the Regional Stakeholder Groups*¶
¶
Each regional stakeholder group (RSG) will be responsible for initially evaluating the existing MPAs within its region. This group will serve as a focus for regional discussions regarding the major aspects of designing MPA alternatives, including: 1) setting goals and objectives; 2) discussing the needs for additional MPAs within the region in order to meet the requirements of the MLPA; 3) evaluating existing relevant biological and socioeconomic information; 4) determining needs for additional information; and 5) developing options on the type, location, size, and boundaries for individual components of the network. The RSG should have the best available scientific information and mapping data for the region, and this information should be available to the public. A member of the SAT subteam will attend each RSG meeting to provide assistance. The RSG will work closely with a sub-team, and both of these groups ... [1]

Formatted: Font: Not Bold, Not Italic

Formatted: Font: Bold, Font color: Red

region. By March 2006, the task force will have provided both the master plan framework and a recommended range of alternative MPAs in the central coast study region to the Department of Fish and Game for its consideration and submission to the California Fish and Game Commission. The MLPA Initiative intends that the master plan framework serve as a basis for future efforts by the Department of Fish and Game and the Fish and Game Commission in implementing the MLPA and in assembling a statewide network by 2011. However, the aim of this master plan framework is to guide the work of the task force over the next year.

This draft master plan framework is meant to establish and guide a process for implementing the MLPA through the design and adoption of MPAs in each region along the California coast. In the coming years, application of the master plan's guidance in individual regions will no doubt lead to changes in the guidance itself. In this sense, this master plan framework should be viewed as a living document that should change adaptively to experience. When a complete MPA network has been adopted by the Fish and Game Commission for all regions in 2011, the requirements of the MLPA for the adoption of a master plan will be met.

It is important to emphasize that this master plan framework is meant to guide decision making about MPAs in individual regions. Specific application of the framework will depend upon the physical, biological, social and economic conditions in the study region. For example, California coastal waters, especially those in southern California, are critical for our nation's military both for training and testing as well as operations. The military (is it the "military" or Department of Defense?) controls two of the Channel Islands and has installations along ~~significant~~ portions of the coastline. Many of the operational ocean areas are significantly restricted to public access. Based on inputs from the military services, the designation of MPAs in designated operational areas of the military is not consistent with military readiness. Therefore, in assessing the overall MLPA network, the beneficial effects of military operational areas with respect to habitat conservation goals will be considered in the needs assessment.

Formatted: Font color: Red, Strikethrough

The central coast effort will provide concrete experience with applying the master plan framework and this more specific guidance to a specific area. This experience~~, in turn,~~ may lead to recommendations to adjust the framework and the guidance on specific topics. In this way, the master plan framework will serve as the foundation for an evolution of practice that adapts to new information.

Formatted: Font color: Red, Strikethrough

Section 2. Design of MPAs and the MPA Network

In order to achieve the statutory mandate of a Marine Life Protection Program, ~~which~~ including a statewide network of MPAs, this master plan framework recommends a process for identifying, reviewing and selecting MPA network~~s~~ components along the California coastline. (The use of "networks" in the plural is confusing here. So are there in fact multiple networks or should this really say network components?)

This section describes the ~~MLPA Blue Ribbon Task Force (BRTF)~~ (has this process been designed by the BRTF?) process to be used to 1) design MPAs in individual regions, 2) determining the considerations to be evaluated in the design of MPAs, and 3) describe the roles of interested parties in this process. Upon completion of the central coast implementation project, the BRTF will provide recommendations to the Department of Fish and Game and to the Fish and Game Commission regarding a process for designing MPAs in other regions of the state.

Deleted: es

Formatted: Font color: Red, Strikethrough

Deleted:

Formatted: Font color: Red, Strikethrough

Formatted: Font color: Red, Strikethrough

Deleted: for

Deleted: ing

The BRTF MPA Design Process

The MPA design process is composed of five general activities:

1. Regional MPA planning, which starts with the identification of a region along the coast that constitutes a logical scientific and governmental locale for studying where MPAs might appropriately be placed;
2. MPA planning, which involves extensive consultation with interested parties, and development of both science teams and regional stakeholder groups;
3. Identification of alternative MPA proposals;
4. Evaluation of the alternative MPA proposals, and identification of the recommended MPA network within each region; and
5. Fish and Game Commission action on MPA proposals.

Figure 2 (next page) illustrates these five general activities and the major elements of each. Table 1 provides a summary of the activities and elements of the activities, together with a list of the lead actors and the groups to be consulted.

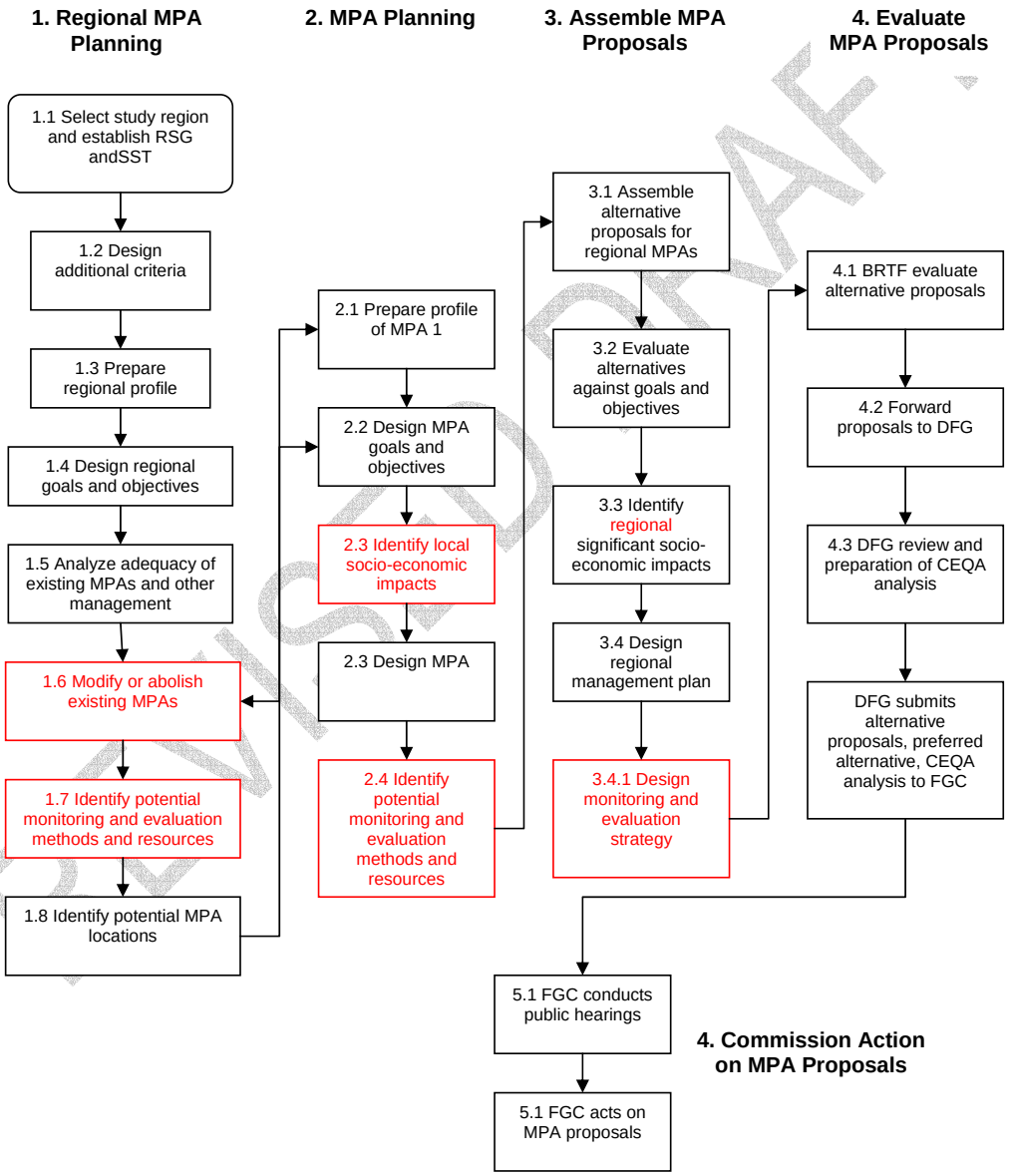
The flow chart (Figure 2) is a significant improvement to this section. With that said there are modifications that should be made. Emphasizing monitoring and evaluation at all stages of design is necessary to ensure goals and objectives are in fact measurable. Goals and objectives should reflect feasibility of monitoring and evaluation.

Monitoring and evaluation activities should also be updated in the table below with specific guidance given to responsible groups.

[ORIGINAL FIGURE 2 DELETED]

Revised Figure 2

Formatted: Aerial 8



Throughout this process, regional discussions will be regularly reported to the BRTF, and as appropriate, to the Fish and Game Commission. In addition, staff will provide informational, logistical, and other support to regional activities.

Table 1: Process for MPA Planning in Study Regions

Key to acronyms: BRTF = Blue Ribbon Task Force; CEQA = California Environmental Quality Act; DFG = Department of Fish and Game; FGC = Fish and Game Commission; MLPAI = MLPA Initiative including DFG; RSG = Regional Stakeholder Group; SAT = Science Advisory Team; SST = Science Sub-Team

	TASK	***LEAD ACTORS***	***SUGGEST/COMMENT***
REGIONAL PLANNING			
1.1	***Establish regional process***		
1.1.1	Select a study region	BRTF	
1.1.2	Convene regional stakeholder group (RSG)	DFG	Stakeholders
1.1.3	Select science sub-team (SST)	SAT	
1.1.4	Develop workplan and budget for regional effort	BRTF/DFG	
1.2	***Develop additional criteria***		
1.2.1	Identify issues requiring additional criteria for designing MPAs in the study region	RSG/SST/MLPAI	Stakeholders/SAT
1.2.2	design additional criteria for designing MPAs in the study region	MLPAI/SST	RSG/Stakeholders
1.2.3	Review additional criteria for designing MPAs in the study region	BRTF/FGC/SAT	RSG/Stakeholders
1.2.4	Adopt additional criteria for designing MPAs in the study region	BRTF	
1.3	***Prepare regional profile***		
1.3.1	Assemble regional information on biological, oceanographic, socio-economic, and governance aspects of the region	MLPAI	Stakeholders
1.3.2	Review general regional information on biological, oceanographic, socio-economic, and governance features of the region	RSG/SST	Stakeholders
1.3.3	Evaluate general distribution of representative and unique habitats	RSG/SST	Stakeholders
1.3.4	Evaluate wildlife populations, habitats, and uses of concerns	RSG/SST	Stakeholders

1.3.5	Evaluate activities in general affecting populations, habitats, and current uses of concern	RSG/SST	Stakeholders
1.3.6	Identify species generally likely to benefit from MPAs, and their regional distribution	RSG/SST	Stakeholders
1.3.7	Identify extent of habitat to be included in MPAs, in general	RSG/SST	Stakeholders
1.3.8	Identify activities other than fishing that affect coastal ecosystems in the region, and management of those activities	RSG/SST	Stakeholders
1.3.9	Develop, review, and adopt regional profile based on the above	RSG/SST/SAT/ BRTF	Stakeholders
1.4	***Design regional goals and objectives***		
1.4.1	Design regional goals and objectives	RSG/SST	Stakeholders
1.4.2	Review regional goals and objectives	BRTF/FGC/SAT	Stakeholders
1.4.3	Approve regional goals and objectives	BRTF	
1.5	***Analyze adequacy of regional management***		
1.5.1	Evaluate existing MPAs against goals and objectives	RSG/SST	Stakeholders
1.5.2	Recommend whether to retain as is, modify, reduce, expand, or abolish existing MPAs	RSG/SST	Stakeholders
1.5.3	Evaluate existing management activities against the MLPA and regional goals and objectives	RSG/SST	Stakeholders
1.5.4	Identify inadequacies in existing MPAs and management	RSG/SST	Stakeholders
1.6	***Identify potential MPAs***	RSG/SST	Stakeholders
PROPOSED MPA PLANNING			
2.1	***Prepare profile of potential MPA***		
2.1.1	Assemble and review information on biological, oceanographic, socio-economic, and governance aspects of MPA	MLPAI/RSG/SST	Stakeholders
2.1.2	Evaluate distribution of representative and unique habitats	RSG/SST	Stakeholders
2.1.3	Evaluate wildlife populations, habitats, and uses of concerns	RSG/SST	Stakeholders
2.1.4	Evaluate activities affecting populations, habitats, and current uses of concern	RSG/SST	Stakeholders
2.1.5	Identify species likely to benefit from MPAs	RSG/SST	Stakeholders
2.1.6	Identify extent of habitat to be included in MPAs	RSG/SST	Stakeholders
2.1.7	Design, review, and adopt MPA profiles	RSG/SST	Stakeholders
2.2	***Design MPA goals and objectives***		
2.2.1	Identify goals and objectives for the MPA	RSG/SST	Stakeholders
2.2.2	Review and request revision of goals and objectives at the MPA	SAT/BRTF	Stakeholders
2.2.3	Approve goals and objectives for the planning site and forward to FGC for review	BRTF	

2.3	***Design MPAs***		
2.3.1	Evaluate existing MPAs against the goals and objectives	RSG/SST	Stakeholders
2.3.2	Evaluate different types of MPAs for meeting goals and objectives of the MPA and of the MLPA	RSG/SST	Stakeholders
2.3.3	Design boundaries, management and enforcement measures for MPAs, as well as monitoring and budgets	RSG/SST	Stakeholders
2.3.4	Identify likely socio-economic impacts of the MPAs	RSG/SST	Stakeholders
2.3.5	Identify recommended measures by other authorities regarding activities other than fishing that adversely affect the resources of the proposed MPA	RSG/SST	Stakeholders
ASSEMBLING ALTERNATIVE REGIONAL MPAS			
3.1	**Assemble MPA proposals into alternative proposals for the regional MPA component of statewide network**	RSG/SST	Stakeholders
3.2	**Evaluate these MPA alternatives against regional goals and objectives and the MLPA**	RSG/SST	Stakeholders
3.3	**Identify significant socio-economic impact**	RSG/SST	Stakeholders
3.4	**Design general management plan for MPAs in the region, including monitoring, enforcement, and financing, periodic review of effectiveness**	RSG/SST	Stakeholders
EVALUATE MPA PROPOSALS			
4.1	**Evaluate alternative proposals for regional MPA component against the MLPA**	BRTF	Stakeholders
4.2	**Forward alternative proposals to DFG for consideration and submission to FGC**	BRTF	
4.3	**DFG review of alternative proposals and preparation of CEQA analysis**	DFG	
4.4	**DFG submission of alternative proposals, preferred alternative and CEQA analysis to FGC**	DFG	
COMMISSION CONSIDERATION AND ACTION			
5.1	**FGC review of alternative proposals and public testimony**	FGC	Stakeholders/DFG/ BRTF
5.2	**FGC acts on MPA proposals**	FGC	

The text below describes in greater detail the process for MPA planning in study regions.

Task 1: Regional MPA Planning

Implementing the statutory goals of the MLPA starts with adoption of the master plan framework. The other main goal of the MLPA is to identify possible MPA sites along the California coast. The task force recommends that DFG and the Fish and Game Commission divide the coast into multiple study regions. At an appropriate time in the future, and after learning the lessons of the Central Coast MLPA Project, the task force will recommend possible regions for future analysis and MPA evaluation. The general steps in this activity, for the task force, are the following (See Figure 2 and Table 1):

During the MLPA Initiative process, designing MPAs begins with identification of a study region by the MLPA Blue Ribbon Task Force (BRTF). The study region will focus initial efforts to implement this framework in a discrete area. For the MLPA Initiative, the BRTF will oversee all aspects of regional planning in the initial study region.

Before approval of this document a more detailed section regarding the selection of the study area should be put here. Understanding what criteria were used and the rational behind the study area decision will be important when using this document to select future regions and warrants detailed discussion. If this is document is to serve as a "case study" it would be prudent to have the initial case laid out in detail.

Activity 1.1: The purpose of this designation is to allow a detailed evaluation of the region and identification of possible MPA sites within that region.

Activity 1.1.1: Based upon advice from the science advisory team, DFG, and stakeholders, a geographical region within which to evaluate and design MPAs is selected.

Activity 1.1.2: Once the study region is identified, the director of the Department of Fish and Game (DFG) convenes a group of stakeholders in the region to participate, as a regional stakeholder group, in the evaluation of existing MPAs and the design of any additional MPAs.

Activity 1.1.3: The science advisory team identifies members who will serve on a science sub-team, which will work closely with the regional stakeholder group, and will serve as a link to the science advisory team.

Activity 1.1.4: In collaboration with the regional stakeholder group and the science sub-team, staff develop a work plan and budget for designing alternative MPA proposals in the study region.

Activity 1.2: Identify issues and design additional criteria.

Activity 1.2.1: The regional stakeholder group, the science sub-team, and staff identify issues requiring additional criteria for designing MPAs in the study region.

Activity 1.2.2: In consultation with the MLPA Science Advisory Team (SAT) staff design draft criteria on these issues.

Activity 1.3: Prepare regional profile.

Activity 1.3.1: Staff assemble regional information on biological, oceanographic, socio-economic, and governance aspects of the region, and draws upon suggestions and information provided by local communities and other stakeholders in the study region.

Activity 1.3.2: The regional stakeholder group and the science sub-team, review regional information and consider comments from stakeholders. The regional groups may request obtaining additional information.

Activity 1.3.3: The regional stakeholder group and the science sub-team evaluate the distribution of representative and unique habitats in the study region and identify any significant gaps in information.

Activity 1.3.4: The regional stakeholder group and the science sub-team identify and evaluate wildlife populations, habitats, and uses of areas in the study region that may be of concern for conservation or other reasons identified in the MLPA.

Activity 1.3.5: As described earlier, marine wildlife and habitats may be affected by a wide range of human activities. The regional stakeholder group and the science sub-team identify such activities affecting marine wildlife and habitats in the study region.

Activity 1.3.6: Drawing the upon species list described elsewhere in the master plan framework, the regional stakeholder group and science sub-team develop a list of species likely to benefit from MPAs and document their regional distribution.

Activity 1.3.7: Drawing upon the list of habitats that are to be represented in marine reserves in a region, the regional stakeholder group and science sub-team recommend the extent of habitat to be included in MPAs within the study region.

Activity 1.3.8: The regional stakeholder group and science sub-team identify activities other than fishing that may affect coastal ecosystems, and describe management of those activities.

Activity 1.3.9: The regional stakeholder group reviews and adopts a regional profile based upon the above activities and submits that profile for review by the science advisory team.

Activity 1.4: Design regional goals and objectives

Activity 1.4.1: Drawing upon the regional profile and the standards of the MLPA, the regional stakeholder group and the science sub-team design recommended regional goals and objectives. (See discussion of setting goals and objectives below.)

Activity 1.4.2: The regional goals and objectives designed in the regional effort are reviewed by the science advisory team, whose comments are forwarded to the task force. The task force reviews the proposed regional goals and objectives and provides

comments and suggestions to the regional effort for consideration in revision. The task force also forwards its comments and suggestions, together with the proposed regional goals and objectives, to the Fish and Game Commission.

Activity 1.4.3: The task force approves the regional goals and objectives, when satisfied that they meet the standards of the MLPA.

Activity 1.5: Analyze adequacy of existing MPAs and management activities

Activity 1.5.1: The regional stakeholder group and the science sub-team evaluate existing MPAs in the study region against the regional goal and objectives and the MLPA.

Activity 1.5.2: The regional stakeholder group and the science sub-team recommend whether to retain as is, modify, reduce, expand, or abolish existing MPAs, and provide a rationale for doing so. Where do these recommendations go within the process (i.e. directly to the BRTF for recommendation, to the DFG) or are they advanced directly to Task 3? More detail on the assessment of existing MPAs would be useful.

Activity 1.5.3: The regional stakeholder group and the science sub-team evaluate existing management of other human activities against regional goals and objectives and the MLPA. Where this other management may meet regional goals and objectives and the MLPA in all or part of the region, this should be noted.

Activity 1.5.4: The regional stakeholder group and the science sub-team identify inadequacies in existing MPAs and management activities in meeting the goals and objectives of the study region and of the MLPA.

Activity 1.6: Identify potential MPAs (if needed)

Task 2: MPA Planning

Activity 2.1: Prepare profile of each MPA. Note that the following seven steps are carried out for each of the MPAs identified in the previous activity.

Activity 2.1.1: Staff assemble information on biological, oceanographic, socio-economic, and governance aspects of the MPA. The regional stakeholder group and the science sub-team review this information and may request additional information.

Activity 2.1.2: The regional stakeholder group and the science sub-team evaluate the distribution of representative and unique habitats in the MPA, based on the information assembled in Activity 2.1.1, and information provided by stakeholders, including local communities and fishermen.

Activity 2.1.3: The regional stakeholder group and the science sub-team identify and evaluate wildlife populations, habitats, and uses of concern in the study site.

Activity 2.1.4: The regional stakeholder group and the science sub-team identify and evaluate activities that may affect populations, habitats, and current uses of concern.

Activity 2.1.5: The regional stakeholder group and the science sub-team identify species likely to benefit from MPAs in the MPA.

Activity 2.1.6: The regional stakeholder group and the science sub-team identify the extent of habitat to be included in MPAs at the MPA.

Activity 2.1.7: In consultation with the regional stakeholder group and the science sub-team, staff prepare a profile of the MPA based on the information developed in activities 2.1.1 to 2.1.6. The regional stakeholder group and the science sub-team review and adopt the profile as the basis for the next major activity.

Activity 2.2: Design MPA goals and objectives

Activity 2.2.1: Based on the site planning profile, the regional goals and objectives, and the MLPA, the regional stakeholder group and the science sub-team designs recommended goals and objectives for MPA(s) at the MPA.

Activity 2.2.2: The regional goals and objectives for the MPA are reviewed by the science advisory team.

Activity 2.2.3: The DFG approves the goals and objectives for the MPA.

Activity 2.3: Designing MPA(s)

Activity 2.3.1: The regional stakeholder group and science sub-team evaluate any existing MPAs against the MLPA's goals and objectives.

Activity 2.3.2: The regional stakeholder group and science sub-team evaluate different types of MPAs and combinations of MPAs for meeting the goals and objectives of the MLPA, regional goals and objectives, and the network.

Activity 2.3.3: The regional stakeholder group and science sub-team design boundaries, management and enforcement measures for MPAs, as well as a monitoring plan and budgets.

Activity 2.3.4: The regional stakeholder group and science sub-team identify likely socio-economic impacts of the MPA(s) that should be considered in subsequent analyses.

Activity 2.3.5: The regional stakeholder group and science sub-team recommend measures that may be taken by other authorities to mitigate the effects of activities other than fishing that adversely affect the resources of the proposed MPA.

Task 3: Assembling Alternative Regional MPAs

Activity 3.1: The regional stakeholder group and science sub-team assembles MPA proposals at individual MPAs into alternative proposals for MPAs in the study region.

Activity 3.2: The regional stakeholder group and the science sub-team evaluate these alternative proposals against regional goals and objectives and the MLPA.

Activity 3.3: The regional stakeholder group and the science sub-team identify potentially significant socio-economic impacts from the alternative proposals.

Activity 3.4: The regional stakeholder group and the science sub-team designs a general management plan for MPAs in the region, including monitoring, enforcement, financing, and periodic review of effectiveness.

Task 4: Evaluate MPA Proposals

Activity 4.1: The regional stakeholder group and the science sub-team forwards the alternative MPA proposals, initial evaluations, and general management plan to the task force, which evaluates these proposals against the MLPA's standards.

Activity 4.2: The task force forwards alternative proposals for MPAs, initial evaluations, and the general management plan, together with its own evaluation, to DFG for its consideration and submission to the Fish and Game Commission.

Activity 4.3: DFG reviews the alternative proposals, initial evaluations, and general management plans, and amends these documents consistent with its authorities. DFG prepares any analyses required by the California Environmental Quality Act (CEQA) or other relevant law.

Activity 4.4: DFG submits the alternative proposals, a preferred alternative, the submissions of the regional groups and the task force, as well as any CEQA or other analysis, to the Fish and Game Commission.

Task 5: Commission Consideration and Action

Activity 5.1: The Fish and Game Commission reviews the alternative regional proposals and takes public testimony.

Activity 5.2: The Fish and Game Commission acts on alternative regional proposals.

Considerations in the Design of MPAs

Designing MPAs in each region will require the consideration of a number of issues, some of which are addressed in the MLPA itself. These are as follows:

- Goals of the Marine Life Protection Program
- MPA networks

- Types of MPAs
- Settling goals and objectives for MPAs
- Geographical regions
- Representative and unique habitats
- Species like to benefit from MPAs
- Enforcement considerations in setting boundaries
- Socioeconomic impacts of MPAs
- Information used in the design of MPAs
- Other activities affecting resources of concern
- Monitoring and evaluation resources and strategies (should be expanded upon below)

Formatted: Bullets and Numbering

Each of these issues is discussed below.

Goals of the Marine Life Protection Program

The foundation for achieving the goals and objectives of the MLPA is a Marine Life Protection Program (MLPP), which must be adopted by the California Fish and Game Commission. The MLPA sets the following goals for the MLPP [FGC subsection 2853(b)]:

(1) To protect the natural diversity and abundance of marine life, and the structure, function, and integrity of marine ecosystems.
(2) To help sustain, conserve, and protect marine life populations, including those of economic value, and rebuild those that are depleted.
(3) To improve recreational, educational, and study opportunities provided by marine ecosystems that are subject to minimal human disturbance, and to manage these uses in a manner consistent with protecting biodiversity.
(4) To protect marine natural heritage, including protection of representative and unique marine life habitats in California waters for their intrinsic value.
(5) To ensure that California's MPAs have clearly defined objectives, effective management measures, and adequate enforcement, and are based on sound scientific guidelines.
(6) To ensure that the state's MPAs are designed and managed, to the extent possible, as a network.

Meeting the goals of the MLPA requires that an MPA network reflect these goals in their own goals, objectives, management, monitoring and evaluation.

The goals of the MLPP go beyond the scope of traditional management of activities affecting living marine resources, which have focused upon maximizing yield from individual species or groups of species. This is particularly true of the first goal, which emphasis biological diversity and the health of marine ecosystems, rather than the abundance of individual species. The second goal recognizes a role for MPAs as a tool in fisheries management. The third recognizes the importance of recreation and education in MPAs, but balances these against the protection of biodiversity. The fourth recognizes the value of protecting representative and unique marine habitats for their own value. The fifth and sixth goals address the deficiencies in

California's existing MPAs that the MLPA identifies elsewhere in the law. (See the glossary in Appendix A for definitions of some key terms in this goal statement.)

MPA Networks

One of the goals of the Marine Life Protection Program calls for designing and managing the state's MPAs as a network, to the extent possible. Although neither statute nor legislative history defines "network," the ordinary dictionary usage contemplates *interconnectedness* as a necessary characteristic of the term. The term "reserve network", which can also be applied to the other two types of MPAs, has been defined as a group of reserves which is designed to meet objectives that single reserves cannot achieve on their own (Roberts and Hawkins, 2000). In general this definition may infer some direct or indirect connection of MPAs through the dispersal of adult and/or larval organisms or other biological interactions. In some cases, larval dispersal rates are not known and oceanography or ocean current patterns may be combined with larval biology to help determine connectivity.

Network components will likely differ in each region of the state. The MLPA also requires that the network as a whole meet the various goals and guidelines set forth by the law and contemplates the adaptive management of that network [Fish and Game Code Section 2857(c)(5)]. In order to meet those goals a strict interpretation of an ecological network across the entire state, based on larval dispersion and connectivity, may not be possible.

There are other interpretations of the term "network" as it applies to MPAs. A network could be simply a coordinated system of MPAs from which valuable science can be derived. MPAs within a network might also be kinked by administrative function, as opposed to biological function. The important aspects of this interpretation are that MPAs are linked by common goals and a comprehensive management and monitoring plan, and that they protect areas with a wide variety of representative habitat as required by the MLPA. MPAs should be based on the same guiding principles, design criteria, and processes for implementation. In this case, a statewide network could be one that has connections through design, funding, process, and management. At a minimum, the Master Plan should insure that the statewide network of MPAs reflects a consistent approach to design, funding and management.

Because of the phased approach of the MLPA Initiative, the statewide network of MPAs called for by the MLPA will be developed in phases, region by region. Within each region, components of the statewide network will be designed consistent with the MLPA and with regional goals and objectives. Each component ultimately will be presented as a series of options, developed in a regional process involving a regional stakeholder group and a sub-group of the Master Plan Science Advisory Team, with a preferred alternative identified by DFG.

Science Advisory Team Advice on MPA Network Design
(Note this information will be revised based on Master Plan Science Advisory Team input and public comment)

1. MPAs should be in different marine habitats, bioregions and upwelling centers

The strong association of most marine species with particular habitat types (e.g., sea grass beds, submarine canyons, shallow and deep rock reefs), and variation in species composition across latitudinal, depth clines and bioregions, implies that habitat types must be represented across each of these larger environmental gradients to capture the breadth of biodiversity in California's waters.

MPAs should also be located inside and outside of all major upwelling centers as well as in all bioregions because upwelling greatly influences the distribution of species on the western coast of the United States. There are about five major upwelling centers off California and Oregon and upwelling plumes transport water offshore at almost all headlands, which are spaced approximately every 100 km along the California coast. Although there is some exchange between adjacent plumes, most of the upwelled water exists in quasi-enclosed cells with eddies that transport water back towards shore. Water circulation associated with these upwelling cells is a key feature in the survival and dispersal of many marine larvae.

2. Target species are ecologically diverse

MPAs protect a large number of species within their borders, and these species can have dramatically different requirements. As a result, it is more practical to think about protecting groups of species based on spatial distribution of functional categories (e.g., sessile invertebrates, sedentary fishes, migratory fishes, mammals, birds, etc.). It is also reasonable to heavily consider the ecologically and economically dominant species groups when selecting MPAs. In addition, knowledge of the distribution of rare and endangered species should supplement the use of species groups.

3. Permanent MPAs are especially critical for long lived animals

Two clear objectives for establishing self-sustaining MPAs are to protect areas that are important sources of spawning biomass and to protect areas that will receive recruits and thus be future sources of spawning potential. In the first objective of protecting areas that serve as source populations, protection should occur both for areas that historically contained high fish abundance and for areas that currently contain high fish abundance. Historically productive fishing areas, which are now depleted, are likely to show a larger, positive, but slower response to protective measures. Areas that currently contain high fish abundance may show a more immediate, but smaller magnitude of response to protection by increasing existing spawning biomass. Protecting historically abundant areas alone is insufficient, however, because the relatively long life span and sporadic recruitment of many marine fishes indicate that it will take a long time after harvest ceases for large spawning animals to repopulate those areas. The biological characteristics of longevity and sporadic recruitment also suggest that the concept of a rotation of open and closed areas will probably not work for species in California as it has for faster growing, more sedentary animals in other parts of the world.

When combining this idea of "permanent" MPAs with a noted lack of monitoring and evaluation (selected sites) the picture being painted is one of "close it down and walk away forever." If an area is designated a marine reserve it is incumbent on the state of California to monitor and evaluate an area to determine if such extreme management techniques are effective, even in

the long term. The idea of permanent MPAs is in direct conflict with the mandate of adaptive management.

4. Size and shape guidelines

Because the information we have on MPAs in California is so limited in most cases we will be drawing on the experiences from other climates and regions for the design and construction of MPAs. It is important that any size or spatial limitations be made flexible should new information become available. We should not place any artificial size or distribution limit on MPAs until more is know about local examples. In this context having these serve as guidelines is fine but not as hard rules.

The size of an individual MPA should be large enough to encompass the typical movements of protected species. Tag returns indicate that net movements of many of the nearshore species, particularly reef-associated species, are on the order of 1-5 km, although a few of the nearshore species have been shown to move tens to hundreds of kilometers. Tagging studies have also shown that the daily movement of many species is much greater than the net annual movements. Thus, a species that is known to have net annual movements of 5 km (for example) will most likely exhibit daily or weekly movements on the order of 10 km. Some of the relatively sedentary species also undertake greater seasonal movements. Information about these adult neighborhood sizes should be part of MPAs design. Current data suggest that MPAs less than about 10 km in extent will be less effective in protecting adult populations. Larger MPAs, 10-20 km are probably a better choice given current data on adult fish movement patterns. Many pelagic fishes have large neighborhood sizes, and are only likely to benefit from small MPAs if fishing pressure is very high.

Less is known about the net movements of most of the deeper water sedentary fishes, especially those associated with soft-bottom habitat, but it is reasonable to suspect that the range of movements will be similar or greater than those of nearshore species. One cause of migration in demersal fishes is the changing resource/habitat requirements of individuals as they grow. Thus, individual ranges can reflect the gradual movement of an individual among habitats, and MPAs that encompass more diverse habitat types will more likely encompass the movement of an individual over its lifetime. Although fisheries may not target younger fish, offshore reserves that include inshore nursery habitats increase the likelihood of replenishment of adult populations offshore. Such reserves would also protect younger fish from incidental take (i.e. by-catch). Fish with moderate movements, especially those in deeper water, will require larger MPA sizes. Because several species also move between shallow and deeper habitat, MPAs that extend offshore (from the coastline to the 3-mile offshore boundary of State waters) will accommodate such movement and protect individuals over their lifetime.

Typically, the relative amount of higher relief rocky reef habitat decreases with distance from shore. In those areas, a MPA shape that covers an increasing area with distance offshore (i.e. a wedge shape) may be an effective design. This shape also better accommodates the greater movement ranges of deeper water and soft-bottom associated fishes. The size of a protected area should also be large enough to facilitate enforcement and to limit deleterious edge effects caused by fishing adjacent to the MPA. MPA shape should ultimately be determined on a